New Power Produced with Historic Windmill

Netherlands

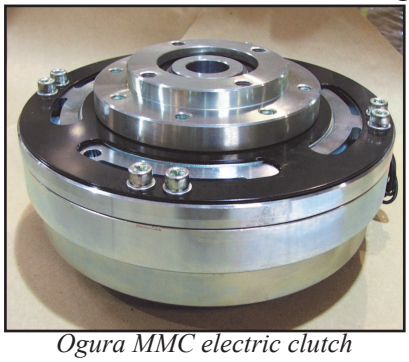
Holland, which is known as the "mills country", has over 1,100 old mills. Some of these are water-powered, but most of these are wind-powered. All of the old mills were overdesigned for their function of either grinding grain, cutting wood or belt driving older machinery. Because of this excess mechanical capacity, it was thought that a power generating system could be added to provide electrical power for the mill and its immediate surrounding area.

Windmill and restaurant "De Zwiepsemolen" Zwiepse/Lochem NL

Ogura MMC electric clutch with high torque robust and compact design for long life is used to drive the 10 kW windmill generator

In November of 2011, the first mill was chosen to receive this add-on power package. It was built in 1851 and although some of the internal workings have been replaced over the years, they still are made to the original wooden gear specifications.

The challenge was to create a generating system that could mesh with the main wooden gear. To do this, a special gear of rollers (similar to the concept of a roller chain) was created. To save space, the plastic rollers drive a right angle gearbox into the clutch and a pancake generator. This allowed the entire package to fit on one side of the wooden gear with no changes to the windmill's exterior.

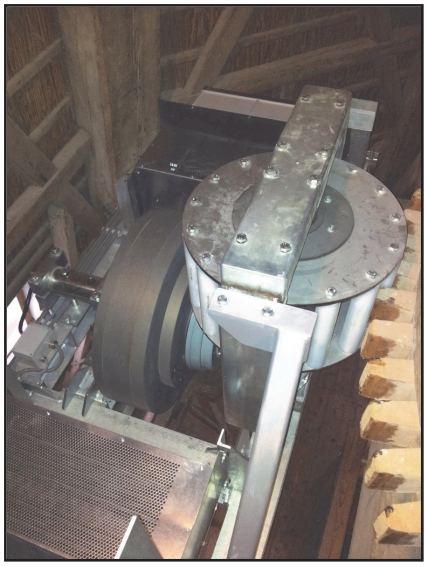


Ogura MMC electric clutch

The Ogura MMC 70 is used to electrically engage and disengage the generator.

The mill blades turn between 4 and 240 rpm. There is a 10:1 speed up ratio between the wooden gear and the customer plastic roller gear. So, the generator turns between 40 and 240 rpm. If wind speed causes the wheel to turn faster than 240 rpm, the clutch is automatically disengaged to protect the generator. Also, if the miller wants to grind grain and not utilize the generator, the clutch is not engaged increasing the overall life of the generator.

Most of the electricity produced by the generator is consumed by the mill and the attached restaurant. However, any excess capacity can also be fed back into the national grid.



Windmill wooden drive gear driving new plastic roller gears and clutch/generator

Total cost of integrating this type of system into these old mills will vary between €45,000-€55,000, but the biggest advantages are fewer red tape problems during installation and no detraction from the historic nature of the landscape.

The Dutch company that put this system together (Dochteren Ind. Automation) is pleased with the performance and the operation of the current system and hopes that after additional testing, new installations will be added this year.

Ogura is very pleased to be involved with this interesting green application.●